ANALYSIS OF FACTORS AFFECTING THE DEVELOPMENT OF AGRICULTURE ON AN INNOVATIVE BASIS

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Abstract. The article presents the need for the development of farming on an innovative basis, important features and factor analysis of innovative development of agricultural farming, approaches to the implementation of an organic farming system.

Key words: farming, innovation, artificial intelligence, agriculture.

Introduction

The total area of Uzbekistan is 44.8 million hectares, approximately 4.5 million hectares of land are suitable for agriculture, of which 4 million hectares are irrigated [1]. Agriculture plays an important role in the economy. 44% of the total population is employed in this field, the population is 33 million people. The annual growth rate of the sector is 1.7% and it is 18% of GDP [2]. Agriculture provides jobs for about 15 million people, many of whom are underemployed. Uzbekistan is characterized by a sharply continental climate, with hot, dry summers, variable weather in winter, and wide seasonal and daily temperature variations. Deserts and steppes are characterized by short winters with thin and inhospitable snow cover, and hot, dry and dusty summers. In the mountains (above 600 meters above sea level) it rains up to 800 mm per year [3].

Main part

The agricultural policy developed by the state in Uzbekistan is aimed at diversifying agriculture and developing environmentally friendly production systems, which will provide higher market access for high-quality products. On December 29, 2015, in accordance with the decision of the President of the Republic of Uzbekistan No. PP-2460 "On measures to further reform and develop agriculture in 2016-2020", the

Government developed a long-term strategy for diversification and intensification of crop production in the country. From 2016 to 2020, approximately 170,000 hectares of cotton and 50,000 hectares of wheat land will be diversified for planting potatoes, vegetables, intensive gardens, fodder, oil and other crops. Since 2010, more than 42 thousand hectares of new intensive orchards have been created. Currently, export earnings from fruits and vegetables make up more than 50% of the total export earnings of agricultural products. As a result, it is observed that the income of farms, land productivity, water supply and the qualification of specialists have increased. As mentioned above, Uzbekistan has achieved good results in agriculture and has not only ensured food security, but also achieved great potential in exporting many agricultural products such as vegetables, fruits and wheat.

The different terrain of Uzbekistan determines the most favorable areas for the cultivation of various food and technical crops. However, there are significant environmental problems based on problems such as increased wind and water erosion, subsidence and deterioration of water quality, loss of biodiversity and loss of natural habitats. The Government of Uzbekistan has recognized the scale of environmental problems in the country; therefore, its main objective is to strengthen the agricultural sector without excessive waste of natural resources. In this regard, development of ecologically safe and sustainable production systems, provision of high-quality products with wider access to the market are seen as potential directions to help achieve this goal.

Farmers need loans to purchase various inputs and machinery, these loans should be provided easily and at low interest rates through rural banks. Support from the state is also needed for the production of prototypes of cheaper techniques and equipment. For example, strategic support is needed for the adoption of water-saving technologies, including rainwater irrigation, drip irrigation, and field mulching.

Adequate subsidies and government intervention are needed to promote such technologies, in addition to existing land privatization, crop diversification, and

agricultural investment initiatives. These efforts are aimed at connecting farmers with markets.

The factors influencing the innovative development of agriculture are as follows:

Modern technologies such as artificial intelligence, robotics, and drones in agriculture are revolutionizing the field. These technologies help to increase productivity, reduce environmental impact and reduce production costs.

Climate change is one of the main factors affecting agriculture. Climate change can lead to limited water resources, changes in weather patterns and the spread of pests, which will require innovative approaches to farming.

Environmental protection and rational use of natural resources are important in ensuring the sustainability of agriculture. Environmentally sustainable methods such as organic farming, soil conservation methods, and water-saving technologies are becoming increasingly important.

Investment in technologies necessary for the development of agriculture, as well as the price and market conditions of agricultural products, are also important. Innovative approaches depend on financial and economic factors, which are one of the main driving forces of agricultural development.

It is important to increase the knowledge and skills necessary to apply new technologies and methods in the field of agriculture. Education and training programs, as well as the exchange of experience, are the main factors in the development of this field.

The policies and legislation applied by governments to the agricultural sector can also have a major impact on the development of farming. Factors such as subsidies, tax breaks, and environmental laws can encourage or limit innovative approaches.

Innovative technologies in agriculture cover various fields and are causing great changes in this field. Here are some of the main types:

Artificial intelligence (AI) and big data analytics are playing an important role in agriculture. These technologies are used in crop growth, disease and pest detection, yield forecasting, and efficient water and fertilizer management.

Robots and automation technologies help in automating processes such as planting, tending plants, harvesting and packaging. This increases production efficiency and reduces labor costs.

Drones are widely used in agriculture, for example, to monitor fields, assess plant health, control pests, and manage water resources.

Hydroponics involves using nutrients dissolved in water, while aeroponics involves feeding plants through air and mist. These methods save water and space.

Genetically modified crops and biotechnology play an important role in agriculture. These technologies help to improve plant disease resistance, productivity and adaptability to environmental conditions.

Advanced technologies to more accurately predict climate changes and weather patterns are critical to agriculture. This helps in optimizing the time of planting and harvesting crops.

Mobile apps and digital platforms give farmers easy access to the information they need. Examples include market prices, weather reports, agricultural advice and financial services.

Technologies that cause less damage to the environment and efficiently use water and energy resources are also widely used. For example, solar panel powered water pumps, organic farming methods, etc.

These technologies will create new opportunities in the field of agriculture, helping to make this sector more efficient and sustainable.

Specific features of agriculture in Uzbekistan include:

Agriculture in Uzbekistan mainly includes field farming, vegetable farming, policing, horticulture, floriculture, and pasture-grazing. Through these networks, it supplies the population with food products, fodder for livestock, and raw materials for industrial sectors [4].

Various agrotechnical measures are used, such as selection of varieties suitable for local soil and climate conditions, crop rotation, good tillage, application of fertilizers, protection from pests [5].

Central Asia, including Uzbekistan, is one of the ancient centers of agriculture. Until the beginning of the 20th century, an extensive farming system was used, and later the scientific base of farming was created, experimental stations and scientific research institutes were established.

After Uzbekistan gained independence, deep reforms were implemented in agriculture. Organizational forms were changed, new forms of economic management appeared, including peasants and farms. Laws on land, water and agriculture were also adopted.

Conclusion

The share of farming in the gross agricultural product of Uzbekistan is 60-65%. High results were achieved due to measures such as the use of advanced agrotechnical methods, the creation of productive varieties of crops, and the effective use of fertilizers.

Currently, there are several approaches to introducing the organic agriculture system in Uzbekistan:

1. Introduction of organic farming systems on vacant land.

2. Implementation of modern permitted biotechnologies in farms engaged in traditional, but actually bio-organic small-scale agricultural production.

3. Complete abandonment of chemical fertilizers and pesticides on existing farms, replacing them with biological plant protection agents, as well as large-scale organic

soil improvers and mineral fertilizers, including crop rotation, planting cover and intercrops, natural ameliorants, energy and introduction of resource-saving technologies.

4. The use of chemical agents can be listed as step-by-step replacement using integrated methods, bio-composites and approved biotechnologies.

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